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Review Article

Screening for Hyperlipidemia

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Abstract

Introduction: The US Preventive Services Task Force (USPSTF) publishes recommendations in regard to the effectiveness of preventive care services for patients without obvious related signs or symptoms.

These recommendations are bed on the evidence of both the advantages and harms of the service and an assessment of the balance.

The USPSTF recognizes that clinical management include more considerations than evidence alone. Doctors should not only think about the evidence but also individualize decision making to the specific patient or situation.

Aim of Work: In this review, we will discuss screening for hyperlipidemia.

Methodology: We did a systematic search for screening for hyperlipidemia using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). All relevant studies were retrieved and discussed. We only included full articles.

Conclusions: The US Preventive Services Task Force (USPSTF) reports support the recommendations about the efficacy and effectiveness of preventive care services for patients without obvious related signs or symptoms. The main conclusion is that the current evidence is insufficient to examine the balance of benefits and harms of screening in children and adolescents twenty years or young.

Keywords: *Screening; Follow Up; Hyperlipidemia; Family Medicine*

Introduction

The US Preventive Services Task Force (USPSTF) publishes recommendations in regard to the effectiveness of preventive care services for patients without obvious related signs or symptoms.

These recommendations are based on the evidence of both the advantages and harms of the service and an assessment of the balance. The USPSTF does not take into consideration the costs of providing a service in this assessment.

The USPSTF identifies that management include more considerations than evidence alone.

In this review, we will discuss the most recent evidence regarding screening of hyperlipidemia.

Methodology

We did a systematic search for screening for hyperlipidemia using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). All relevant studies were retrieved and discussed. We only included full articles.

The terms used in the search were: screening, follow up, hyperlipidemia, family medicine.

Significance

Dyslipidemia is a genetic or multifactorial disorder of lipoprotein, known by the higher levels of total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C) or combinations of that. Elevations in levels in lipid profile of TC, LDL-C, are linked with a higher in the risk of cardiovascular disease, as are lower levels of HDL-C and, to a lesser extent, elevated triglyceride levels.

Heterozygous familial hypercholesterolemia happens in about one of every two hundred individuals in North America and Europe and is more prevalent among populations with known founder effects (up to 1of100persons) [1].

Familial hypercholesterolemia is known in the literature but in general includes highly elevated LDL-C levels (e.g. > 190 mg/dL), genetic mutation, or both.

Otherwise, dyslipidemia with both polygenic and environmental causes, involving obesity. Multifactorial dyslipidemia is defined by elevations in levels of LDL-C (> 130 mg/dL, TC (> 200 mg/dL), or both that are not attributable to familial hypercholesterolemia [2]. Obesity is linked with slight elevations in LDL-C; it is more linked to elevated triglycerides and lower HDL-C.

Recent data from the National Health and Nutrition Examination Survey (NHANES) showed that more than seven percent of children aged 8 to 17 years have higher levels of TC (> 200 mg/dL), and about 7.4% of adolescents aged 12 to 19 years have higher LDL-C (> 130 mg/dL) [3]. The rationale for screening for lipid disorders in children and adolescents is that early identification and treatment of high levels of LDL-C could potentially delay the atherosclerotic process and thereby decrease the incidence of premature ischemic cardiovascular events in adults.

The USPSTF made a conclusion that insufficient evidence on the quantitative difference in diagnostic yield between universal and selective screening for familial hypercholesterolemia or multifactorial dyslipidemia.

Familial hypercholesterolemia

The USPSTF reported adequate evidence from short-term trials less than 2 years that pharmacotherapy lead to substantial reductions in levels of LDL-C and TC in children with familial hypercholesterolemia. The USPSTF found inadequate evidence on the association between changes in intermediate lipid outcomes or noninvasive measures of atherosclerosis in children and adolescents and incidence of or mortality from relevant adult health outcomes [4].

Multifactorial dyslipidemia

The USPSTF reported inadequate evidence on the benefits of lifestyle modification or pharmacotherapy interventions in children and adolescents with multifactorial dyslipidemia to enhance intermediate lipid outcomes or atherosclerosis markers or to decrease incidence of premature cardiovascular disease.

The USPSTF concluded inadequate evidence to examine the disadvantages of screening for familial hypercholesterolemia or multifactorial dyslipidemia. The USPSTF reported insufficient evidence to examine the long-term disadvantages of treatment of familial hypercholesterolemia in children or adolescents [5].

Short term usage of statins was in well tolerated in children and adolescents with familial hypercholesterolemia, with transient adverse effects (such as elevated liver enzyme levels).

USPSTF assessment

The USPSTF found that the recent evidence is insufficient and that the balance of advantages and disadvantages of screening for lipid disorders in asymptomatic children.

Patient population

This recommendation implies on asymptomatic children twenty years or younger without a known diagnosis of a lipid disorder. Familial hypercholesterolemia in children might have TC and LDL-C levels two to three times higher than those of unaffected children. Familial hypercholesterolemia is asymptomatic generally in children and adolescence. By age fifty years, about quarter of women and half of men with untreated familial hypercholesterolemia will experience clinical cardiovascular disease.

Coronary artery disease is higher in males by age fifty years and around quarter of females by age sixty years.7,8 Mortality rates from coronary artery disease is higher in adults younger than sixty years with familial hypercholesterolemia. Among adults surviving to age sixty years, the risk of coronary heart disease approaches that of the general population [6].

Multifactorial dyslipidemia is defined by elevated levels of LDL-C (> 130 mg/dL) or TC (> 200 mg/dL) that are not linked to familial hypercholesterolemia. 2 Many studies have linked an association between childhood lipid levels in this range and measures of atherosclerosis in adulthood. Studies revealed that tracking lipid levels from childhood and adolescence to adulthood could not predict which individuals will have elevated LDL-C or TC as adults [7]. Additionally, the association between multifactorial dyslipidemia in childhood and adolescence and clinical cardiovascular disease in adulthood is unknown.

Potential disadvantages

The majority of children with elevated lipid levels of a multifactorial origin will not further progress to a clinically important lipid disorder or develop premature cardiovascular disease and over-diagnosed. Screening can also lead to the labeling of children with a non-disease.

Current practice

Generally speaking, the screening rates for dyslipidemia in children and adolescents have been less than expected. Based on the National Ambulatory Medical Care Survey, 2.5% of well-child visits involved lipid testing in 1995 and three percent included it in 2010.10 Claims data from health insurance plans reports rare use of lipid-lowering pharmacotherapy in eight to twenty -year-olds [8].

Screening tests

Cholesterol levels differ by sex and age throughout childhood. It is known that total cholesterol levels start to elevate since birth, stabilize at about age two years, peak before puberty, and then decrease slightly during adolescence [9]. Abnormal lipid levels in young population are based on population distributions, not associations with health outcomes.

It is unknown to what degree elevated lipid levels in children and adolescents twenty years or younger are associated with future disease risk. High lipid levels track modestly into adulthood, making it hard to predict which children and adolescents will continue to have elevated cholesterol levels as adults [10]. Levels of TC can be measured with fasting or non-fasting serum testing.

Management of dyslipidemia

Management involves lifestyle interventions and medications (e.g statins, bile acid–sequestering agents, or cholesterol absorption inhibitors). Statins, or 3-hydroxy-3-methyl-glutaryl coenzyme A reductase inhibitors, have been largely adopted for use in adults with hypercholesterolemia, because these drugs are effective at lowering cardiovascular events in high-risk adults. As a result of their efficacy in adults, statins are one of the first-line medications considered for use in children and adolescents with hypercholesterolemia [11].

Discussion

Burden of disease

Results from the 2011 - 2012 NHANES calculated the prevalence of high TC levels in children aged 8 to 17 years as 7.8%, and data from the 2007 - 2010 NHANE estimate the prevalence of high LDL-C levels in adolescents as 7.4%. These are probably exaggerated estimates of the true prevalence of dyslipidemia because of within-person variability. Repeat testing in an individual is necessary identify children and adolescents with high lipid levels [12].

More attention has been directed at screening for dyslipidemia in childhood and adolescence as atherosclerosis begins in youth; lipid levels in youth are associated with the degree of atherosclerosis in adulthood; familial hypercholesterolemia is linked with premature ischemic cardiovascular disease; short-term treatment of familial hypercholesterolemia with statins substantially lowers LDL-C levels and, based on 1 study, enhances measures of atherosclerosis; abnormal lipid levels in adulthood have been linked with the risk of coronary heart disease events; and early recognizing and intervention with cholesterol-lowering therapy in certain populations of adults can prevent such events [13].

Screening in young and adolescents may identify those with undiagnosed familial hypercholesterolemia or multifactorial dyslipidemia. while the clinical health advantages and risks among children and adolescents recognized with and managed for dyslipidemia have been insufficiently studied, making the role of screening in children and adolescents uncertain [14].

Conclusions

Dyslipidemia is considered a genetic or multifactorial disorder of lipoprotein metabolism The US Preventive Services Task Force (USPSTF) reports recommendations on to the effectiveness of preventive care services for patients with no clear signs or symptoms.

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